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4. TITLE AND SUBTITLE Photophysics of Polycyanate Resin and Triazine Compounds		pounds	5. FUNDING NUMBERS NR 413 m 011 N00014-89-J-1145		
6. AUTHOR(S) Y.E. Xu and C.S.P. Sung					
7. PERFORMING ORGANIZATION P Institute of Materials 97 N. Eagleville Rd. University of Connectic Storrs, CT 06269-3136	Science		8. PERFORMING ORGANIZATION REPORT NUMBER Technical Report No. 54		
9. SPONSORING/MONITORING AC ONR 800 N. Quincy Ave. Arlington, VA 22219	SENCY NAME(S) AND ADDRESS(E		10. SPONSORING / MONITORING AGENCY REPORT NUMBER		
11. SUPPLEMENTARY NOTES published in ACS Polyme	er Preprints, 37(2), 208, 19	195	970714 071		
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Dicyanate ester resins have a strong fluorescence and phosphorescence emission. In this work, we report fluorescence and UV spectroscopic characterization of triazine compounds, and identify that the strong fluorescence emission comes from substituted triazine rings which are formed during the cure reaction of polycyanate resins. A series of model compounds were investigated. The results show that substituted triazine rings have similar fluorescence emission to triazine vapor. The emission at 350nm corresponds to sharp emission (335nm) in triazine vapor, and that at 420nm to broad emission (395nm). The large aromatic substituent enhances broad emission which corresponds to the singlet-triplet coupling, and solvation decreases it. When samples are photo or thermally excited, the coupling states start to interact with environment and split to the original states. The split depends on excitation time, concentration and polarity of media.					
dicyanate ester, polyc	cyanate, triazine, fluoresce	nce and phosphorescenc	15. NUMBER OF PAGES 2 16. PRICE CODE		
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	ATION 20. LIMITATION OF ABSTRACT		

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Spectroscopic and Model Compx characterization of Bismaleir Thermoset Resin 6. AUTHOR(S) J. Phelan and C.S.P. Sung	ound studiesin the cure mide/Diallybisphenol-A		R 413 m 011 00014-89-J-1145		
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7. PERFORMING ORGANIZATION NAME	(S) AND ADDRESS(ES)		ENFORMING ORGANIZATION EPORT NUMBER		
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University of Connecticut			•		
Storrs, CT 06269-3136					
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Arlington, VA 22219					
11. SUPPLEMENTARY NOTES		_			
Published in ACS Polymer Pre	prints, 38(1), 227, 199	7			
12a. DISTRIBUTION / AVAILABILITY STAT	TEMENT	12b.	DISTRIBUTION CODE		
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resin cure are reported for th	ree cure schedules. The fo	n accompany bismaleimide/dia	es is attributed		
to Ene, Diels-Alder, and alte	rnating copolymerization r	eactions involving phenylmale	imide and		
allylphenol groups. The for	mation of 2-propenyphenol	vinyl groups is attributed to E	ne reaction		
between allylphenol groups and maleimide groups, as well as by direct isomerization of allylphenol.					
The destruction of 2-propenylphenol vinyl groups is provided by UV-reflection spectroscopy.					
Evidence for Diels-Alder reactions followed by re-aromatization processes is provided by UV-reflectance spectroscopy. Fluorescence signals are initially quenched, but increase and then level off					
as the resin cures. Model co	as the resin cures. Model compound studies indicate that emissions that occur at 356nm when the				
resin is excited at 280nm are	from the phenolic portion	of the resin, while emissions th	at occur at		
440nm when the resin is excited at 380nm are from phenyl-succinimide. Structure arising from					
Diels-Alder-Ene and alternating copolymerizataion reaction sequences have also been confirmed by					
model studies. Support that the final stages of cure involve re-aromatization of phenolic groups and					
crosslinking reactions of 2-propenylphenol vinyl groups is presented.					
14. SUBJECT TERMS Fluorescence, FT-IR, UV reflectance, bismaleimide, diallybisphenol-A, Ene,			15. NUMBER OF PAGES 2		
Diels-Alder and Alternating copolymerization Reactions.		16. PRICE CODE			
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4. TITLE AND SUBTITLE Twidization study by Change Transfer Fluorescence NE		5. FUNDING NUMBERS NR 413 m 011 NOO014-89-J-1145	
6. AUTHOR(S)			
J.W. Yu and C.S.P. Sung			
7. PERFORMING ORGANIZATION NAME Institute of Materials Science		В	PERFORMING ORGANIZATION REPORT NUMBER
97 N. Eagleville Rd. University of Connecticut Storrs, CT 06269—3136			Technical Report No. 56
9. SPONSORING/MONITORING AGENCY ONR 800 N. Quincy Ave. Arlington, VA 22219	NAME(S) AND ADDRESS(E	5) 1	O. SPONSORING / MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES Published in Macromolecules,	30, 1845, 1997		
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The extent of imidization for sev longer wavelength. The fluoresc imidization proceeded. Fluoresc changes were correlated with the of the extent of imidization of are	ence excitation near 460m ence solution study confine extent of imidization. Th	m showed red shifts and the med the origin of CT comple	ir intensities decreased as the ex formation. These spectral
14. SUBJECT TERMS Imidization, polyamic acid, p fluorescence	oolyimide, charge trans	sfer complex	15. NUMBER OF PAGES 2 16. PRICE CODE
7. SECURITY CLASSIFICATION 18. S OF REPORT 0	ECURITY CLASSIFICATION F THIS PAGE	19. SECURITY CLASSIFICAT OF ABSTRACT	TION 20. LIMITATION OF ABSTRACT
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Storrs, CT 06269-3136					
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11. SUPPLEMENTARY NOTES					
Published in J. Appl. P	olym. S	Sci., 63, 1769, 1997			
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Monitorin	o the res	action of an aromatic dias	nine cure agent with epox	vy hy fly	27000moo
technique was used	for cur	e characterization of the i	nterphase in epoxy/glass:	and anov	orescence
composites. The ef	fect of t	the various surface treatm	ents was first studied by	anu epox	1 internal and
obtained by using a	anartz	nlate for glass or a modif	ied quartz plate for carbon	n cumfo e e	A main a mile a
treated quartz cured	facter	and showed increased our	e extent, while water agir	ii suriace	. Amnoshane
showed almost no	effect or	the cure kinetics in som	parison to the untreated q	ig and ai	r oxidation
model carbon surfa	ce sir o	vidation showed a factor	parison to the untreated q	uartz sur	race. For a
The effect	cofthe	vatious surface treatment	reaction only at the early	stage of	cure.
the actual composit	s or made	various surface freatment	s on glass or carbon fiber	were als	o studied with
In the case of energy	cs made	of the second site is the	ky-diamine melt on the m	odel inte	rphase system.
foster cure reaction	y-carbor	a liber composite, both at	r oxidation and water agii	ng treatm	ent showed a
aster cure reaction	at the e	arry stage of cure. Further	ermore, air oxidation treat	ment for	the
epoxy/carbon liber	compos	site showed somewhat inc	reased cure extent. The r	easons fo	or these trends
have been discussed	1 .				
4. SUBJECT TERMS					,
Composite interphase, co	ire cha	racterization diamin	e mire acent		15. NUMBER OF PAGES
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4. TITLE AND SUBTITLE In-Situ Cure Monitoring of Poreflectance spectroscopy 6. AUTHOR(S) D.K. Hestermann and N.H. Sung	lyimide Via UV/visible		5. FUNDING NUMBERS NR 413 m 011 N00014-89-J-1145 n
7. PERFORMING ORGANIZATION NAM Institute of Materials Science 97 N. Eagleville Rd. University of Connecticut Storrs, CT 06269-3136			8. PERFORMING ORGANIZATION REPORT NUMBER Technical Report No. 58
9. SPONSORING / MONITORING AGENC ONR 800 N. Quincy Ave. Arlington, VA 22219	Y NAME(S) AND ADDRESS(E	5)	10. SPONSORING / MONITORING AGENCY REPORT NUMBER
11. SUPPLEMENTARY NOTES Published in ACS PMSE proceed	lings, 75, 385, 1996.		
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an in-situ monitoring tech (Hexafluoroisopropylidie monitored in-situ by mean reflectance spectra allowed new class of high tempera also been investigated by only the endgroups, was in not by UV reflection. The	ctroscopy coupled with a base inique for polymer reaction ne) diphthalic anhydride (6F suring UV reflectance of the ed quantitative assay of the ature resin based on phenyle UV/Visible, fluorescence, a cound to be measurable only the paper also discusses the istensitivity in reflectance meaning.	s. Thermal imidization of a FDA) and p-phenylene diant is sample during its cure. Do amic acid to imide converse thynyl endcapped polyimicand IR spectroscopy. Cure by IR, and to some extent is sues involved in the use of	4,4'- nine(PDA) was Deconvolution of the ion in 6FDA/PDA. A de p repolymers has reaction, involving by fluorescence, but
4. SUBJECT TERMS UV/Visible reflection spectre imidization, phenylethynyl en	ndcapped polyimide, flu		15. NUMBER OF PAGES 2 16. PRICE CODE
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. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE A	AND DATES COVERED
	June 20, 1997	Technical 06/	/96–05/97
4. TITLE AND SUBTITLE In-Situ characterization of HMI/DABPA via Fiberoptic Fluorescence		5. FUNDING NUMBERS NR 413 m 011 N00014-89-J-1145	
. AUTHOR(S)		· <u> </u>	7
H.J. Paik and N.H. Sung			
PERFORMING ORGANIZATION NAME Institute of Materials Scienc 97 N. Eagleville Rd.			8. PERFORMING ORGANIZATION REPORT NUMBER
University of Connecticut Storrs, CI 06269-3136			Technical Report No. 59
SPONSORING / MONITORING AGENCY	NAME(S) AND ADDRESS(E	ES)	10. SPONSORING / MONITORING AGENCY REPORT NUMBER
800 N. Quincy Ave. Arlington, VA 22219			
. SUPPLEMENTARY NOTES	<u> </u>		
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stem has been investigated webserved to show a fluoresce compared to other common are ery stable even at those elevations are stable even at those elevations are stable for the emportance of t	with bifurcated fiberory nce emission at ~590 comatic molecules. The vated cure temperatury around 550nm, which this long wavelength ission peak upto 60 n this characteristic fluoteter, the spectral sh	otic fluorimeter. BNDnm, an unusually lespectra was not sures. According to a led us to believe the emission. During m. An attempt was rescence peak position.	-diallyl bisphenol-A (DABPA) II, the key monomer itself, was longer wavelength region when bject to photobleaching, and was UV-Vis analysis, a very weak nat a charge transfer complex on g the cure process, there was a smade to follow the reaction of ion shift. Using a custom-built, in-situ or on-line at the cure
SUBJECT TERMS			
	leimide, diallyl bisphe	enol-A, bisfurcated	15. NUMBER OF PAGES 2
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1. AGENCY USE ONLY (Leave blank) 2 REPORT DATE June 20, 1997	3. REPORT TYPE AND DATES COVERED Technical 06/96-05/97		
4. TITLE AND SUBTITLE Reaction Monitoring Epoxy/Fiber Interphase using Evanesc Fluorimetry-Instrumentation and Methods	s. Funding numbers Pent wave NR 413 m 011 NO0014-89-J-1145		
6. AUTHOR(S) A. Fuchs and N.H. Sung			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Institute of Materials Science 97 N. Eagleville Rd. University of Connecticut Storrs, CT 06269-3136	8. PERFORMING ORGANIZATION REPORT NUMBER Technical Report No. 60		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) ONR 800 N. Quincy Ave. Arlington, VA 22219	10. SPONSORING / MONITORING AGENCY REPORT NUMBER		
11. SUPPLEMENTARY NOTES Published in a book "Polymer Surfaces and Interface" 345 L.K. Mittal, USP. Netherland, 1997	5, Ed. K.W. Lee and		
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Abstract—Cure characteristics of epoxy in the epoxy/fiber interfar an evanescent wave fluorescence technique. This paper describe which allows in situ monitoring of epoxy reactions at the interfacture of diepoxide, diglycidyl ether of bisphenol-A (DGEBA), an sulfone (DDS) is followed by measuring the fluorescence intensity dye, diaminoazobenzene (DAA), as it is converted from a primar cure. By using a sapphire optical fiber as an evanescent wave measured within an approximately 150 nm thin layer of epoxy at value and the good UV-visible transmission character of the sa as an evanescent probe for DGEBA/DDS epoxy. A number of maximize the evanescent wave intensity, which include a polymetallization of the fiber tip. Cure reaction in the interphase regi	es the methodology and instrumentation ce. The reaction of a stoichiometric mixing the curing agent 4,4'-diaminodiphenyl cychange of the externally added reactive cry amine to a tertiary amine state during probe, the fluorescence intensity can be the fiber surface. A high refractive index apphire make it the only fiber acceptable of optical innovations are introduced to mer cladding for the sapphire fiber and		
4. SUBJECT TERMS Epoxy; cure monitoring; interphase; even-scent fluorescent	ence; fiberoptic, 15. NUMBER OF PAGES		
sapphire optical fiber, optical innovations, methodology, instrumentation 16. PRICE CODE			

17. SECURITY CLASSIFICATION OF REPORT

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19. SECURITY CLASSIFICATION OF ABSTRACT